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American Association of Zoo Keepers, Inc.

The American Association of Zoo Keepers, Inc. exists to advance excellence in the animal keeping profession, foster effective communication beneficial to animal care, support deserving conservation projects, and promote the preservation of our natural resources and animal life.

About the Cover

This month's cover photo comes to us from Ashley Arimborgo of Cheyenne Mountain Zoo. The photo features Hadiah and Ember, Bornean orangutans (*Pongo pygmaeus*). Ember was born on October 29, 2014 and is Hadiah's second offspring. Ember was not nursing at first so she was hand-raised for about two weeks while trainers worked with Hadiah on further maternal training and allowing supplemental bottle feedings. To learn more about their story, go to pp. 342-346.

Palm oil, when produced unsustainably, results in deforestation and has become the biggest threat to the survival of orangutans in the wild. Palm oil is used in many everyday items, from cookies to cosmetics, and as a source of biofuel. One of the best ways to help orangutans and their habitat is to educate ourselves and our guests about the issues related to palm oil and orangutans. Sharing how our awareness and daily actions can have positive effects is an important conservation tool.

Articles sent to **Animal Keepers' Forum** will be reviewed by the editorial staff for publication. Articles of a research or technical nature will be submitted to one or more of the zoo professionals who serve as referees for **AKF**. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Lengthy articles may be separated into monthly installments at the discretion of the Editor. The Editor reserves the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed, appropriately-sized envelope. Telephone, fax or e-mail contributions of late-breaking news or last-minute insertions are accepted as space allows. Phone (330) 483-1104; FAX (330) 483-1444; e-mail is shane.good@aazk.org. If you have questions about submission guidelines, please contact the Editor. Submission guidelines are also found at: aazk.org/akf-submission-guidelines/.

Deadline for each regular issue is the 3rd of the preceding month. Dedicated issues may have separate deadline dates and will be noted by the Editor.

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Animal Data Transfer Forms available for download at aazk.org. AAZK Publications/Logo Products/Apparel available at AAZK Administrative Office or at aazk.org.

ANIMAL KEEPERS' FORUM

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FROM THE PRESIDENT



Happy Holidays and Merry Christmas!

I am very thankful for my family, including my furry (and scaly) kids, for my career in zoo keeping and for my involvement in the American Association of Zoo Keepers (AAZK). I hope you are enjoying the holiday season and spending time with family and friends.

There is a balance between family, work and hobbies that we all work on throughout the year. Being an AAZK Board Member is a passionate second job for me. This coming year, we will have elections for Board Members. There will be four positions available, as we will be expanding from a five-member board to a seven-member board with the addition of the International Outreach Committee this past year and the new AAZK Resource Committee. If you are interested in volunteering as a Board Member, please contact Bethany, Bill, Mary Ann, Denny or myself to learn more.

Our Association was founded by volunteers and they continue to be our foundation. We have had some personnel changes, which I recently shared via e-mail blast with Chapters, but also wanted to include in the *Animal Keeper's Forum*. Rachael Rufino has resigned from her position as a Board Member to pursue a career in another field. Our Bylaws require a Board Member to be a Professional Member in good standing, as we are primarily a professional association for zoo keepers. Please help me wish Rachael well in her new endeavor! We have appointed Denny Charlton, from the National Zoo, as an interim Board Member to fill her position until elections are held and new Board Members are sworn in at the National Conference in 2017. Denny was the Vice-Chair of the Awards Committee and will be oversight for the Awards Committee and Grants Committee.

We have dissolved the Director of Professional Development position and Bob Cisneros is focusing on his career as Curator at The Big Bear Alpine Zoo in California. AAZK's Professional development has changed focus and will be discontinuing AAZK Online, due to membership feedback, effective in January. AAZK Vice President, Bethany Bingham, is oversight of the Professional Development Committee (PDC) and they are working on the conference program and professional development opportunities for you. Now is the time to discuss your idea for a workshop, paper or poster presentation with your manager and check with PDC at pdc@aazk.org for submission guidelines and deadlines.

Patty Pearthree has resigned as the Bowling for Rhinos (BFR) Program Manager due to personal changes in her life. We are thankful to Patty for all her years of volunteer service and helping make BFR the successful program it is today. Patty wanted the membership to know... "This was not an easy decision to make, on my part. The past 27 years have been very rewarding. I've enjoyed working with you to grow a very successful program for wildlife conservation worldwide." We wish her all the best! It is volunteers like her, by AAZK Committee and Board Members and You, who make it possible. We are in the process of reorganizing the BFR program into a committee structure where there will be additional volunteer opportunities for you.

The year 2017 promises to be a busy and productive new year for AAZK, as we work together growing BFR, Trees for You and Me, the AKF, our conferences and committees. I am grateful to be a part of it.

If you have any questions or comments, please e-mail me at Penny.Jolly@aazk.org.

Best regards,

A handwritten signature in black ink, appearing to read "Penny Jolly". The signature is fluid and cursive, with a large, stylized "J" and "L".

Penny Jolly

Happy Holidays



As 2016 winds down, we want to acknowledge how grateful we are for all our wonderful customers. Happy Holidays and thank you for your business.



COMING EVENTS

Post upcoming events here!
e-mail shane.good@aazk.org

February 6-9, 2017

6th International Sea Duck Conference

Tiburon, CA

Hosted by Audubon, Ducks Unlimited, USFWS, USGS, and California Department of Fish and Wildlife.

For more information go to:
seaduckconference.net/

March 11-15, 2017

23rd Annual Aquatic Animal Life Support Operators (ALLOYS) Symposium

St. Louis, MO

Hosted by Saint Louis Zoo
For more information go to:
www.aalso.org

March 26-31, 2017

AZA Mid-Year Meeting

Albuquerque, NM

Hosted by ABQ BioPark
For more information go to:
aza.org/conferences-meetings

April 4-7, 2017

International Zoo Design Conference

Wroclaw, Poland

Hosted by Wroclaw Zoo and ZooLex Zoo Design Organization

For more information go to:
zoodesignconference.com/

April 17-20, 2017

African Painted Dog Conference

Topeka, KS

Hosted by Topeka Zoo
For more information go to:
<http://topekazoo.org/APDconference/>

April 17-22, 2017

AZA Best Practices in Animal Keeping Course

Buffalo, NY

Hosted by Buffalo Zoo
For more information go to:
aza.org

April 23-28, 2017

ABMA Annual Conference

Cincinnati, OH

Hosted by Cincinnati Zoo and Botanical Garden.

For more information go to:
theabma.org/abma-annual-conference/

July 12-22, 2017

International Herpetological Symposium

Rodeo, NM

Hosted by Chiricahua Desert Museum

For more information go to:
internationalherpetologicsymposium.com/40th-annual-symposium/

August 28-30, 2017

Old World Monkey Husbandry Workshop

Columbus, OH

Hosted by Columbus Zoo
For more information contact
Audra Meinelt:
Audra.Meinelt@columbuszoo.org

August 27-31, 2017
AAZK National Conference
Washington, D.C.

Hosted by the National Capital AAZK Chapter and Smithsonian's National Zoo

facebook.com/AAZK2017



September 9-13, 2017
AZA Annual Conference
Indianapolis, IN
Hosted by Indianapolis Zoo
For more information go to:
www.aza.org/conferences-meetings

CALL FOR NOMINATIONS

AAZK Board of Directors

The American Association of Zoo Keepers (AAZK) is seeking nominations for four (4) positions on the AAZK Board of Directors. Each candidate shall be nominated by a Professional peer within AAZK. Qualified candidates shall be active Professional Members in good standing with AAZK. AAZK Bylaws require that a Board Member have the title of Animal (Zoo) Keeper or similar and if in a supervisory role at their facility, maintain daily husbandry contact with the animal collection. AAZK reserves the right to contact the candidate's employer to verify candidate's job duties conform to AAZK policy. The electronic voting period to elect Board Members to the Association will be open from **May 1, 2017 to June 1, 2017** on the AAZK website.

Preferred Experience:

Experience as an officer in an AAZK Chapter, Committee Chair, or Conference Chair. Excellent organizational and time management skills, coupled with the ability to meet tight deadlines; problem solving and motivation of subordinates and quality public speaking skills.

Requirements:

Each elected candidate shall be required to attend monthly electronic meetings of the AAZK Board of Directors, read and answer daily electronic communications, supervise the work of Committees and/or Program Managers and shall be required to attend the annual AAZK Conference. An elected candidate can expect to commit anywhere from 2-4 hours per week in the performance of AAZK Board duties.

Nominations:

A Letter of Nomination shall include:

- Name of Candidate
- Zoo Affiliation
- Zoo Position Title
- Contact Information (address) including a phone number
- E-mail address

The Letter of Nomination shall include a brief synopsis of candidate work history, previous experience within AAZK and detail the number of years within the Profession. Deadline for Nominations to the AAZK Board of Directors shall be postmarked or e-mailed prior to midnight **February 28, 2017**.

Nominations can be sent to Ed.Hansen@aazk.org or mailed to:

Ed Hansen, CEO/CFO AAZK
8476 E. Speedway Suite 204
Tucson, AZ 85710-1728



Reminder – AAZK Professional Members AAZK Board of Directors Electronic Voting

Candidate profiles for election to the AAZK Board of Directors may be viewed at www.aazk.org beginning **April 1, 2017**.

Professional Member electronic voting for candidates to the AAZK Board of Directors will open on the AAZK website (www.aazk.org) on **April 15, 2017** and will close at midnight June 1, 2017.

2017 AAZK AWARDS NOMINATIONS OPENED

The American Association of Zoo Keepers AAZK Awards Committee is accepting nominations for the following awards:



- Lifetime Achievement Award
- Meritorious Service Award
- Lutz Ruhe Meritorious Achievement — AAZK Professional of the Year Award
- Jean M. Hromadka AAZK Excellence in Animal Care Award
- Nico van Strien Leadership in Conservation Award
- Lee Houts Advancement in Enrichment Award
- Certificate of Merit for Zoo Keeper Education
- Certificate of Excellence in Exhibit Renovation
- Animal Nutrition Award

Awards will be presented at the 2017 AAZK Conference in Washington, D.C. The deadline for nominations is 1 May 2017. Information concerning the qualifications, nomination procedure, selection procedure and an explanation of the awards may be obtained at www.aazk.org, under committees/awards.



NEW GRANT BEING OFFERED!

AAZK is now offering a grant specifically for the National Conference. This is a great way to get funding to attend the next conference without competing against other professional development opportunities. If you are interested in applying for the new AAZK National Conference Grant details will soon be on the AAZK website.

Qualifications: Full-time keepers/aquarists in zoological parks and aquariums, who are professional members of AAZK, INC. in good standing, are eligible to receive grants.

AAZK will still be offering the AAZK Professional Development Grant, the Research Grant and the Conservation, Preservation, Restoration Grant. All four grants will be due March 1, 2017 so start thinking now of all the exciting things you can accomplish with these grants.

“Keepers United in Saving Species”

The 44th Annual AAZK National Conference

Washington D.C., August 27-31 2017



Conference information continually updated at www.ncaazk.org. Follow www.facebook.com/AAZK2017/ for the latest information. For information regarding submission deadlines for Conference workshops, papers and posters, please contact the AAZK Professional Development Committee at pdc@aazk.org.



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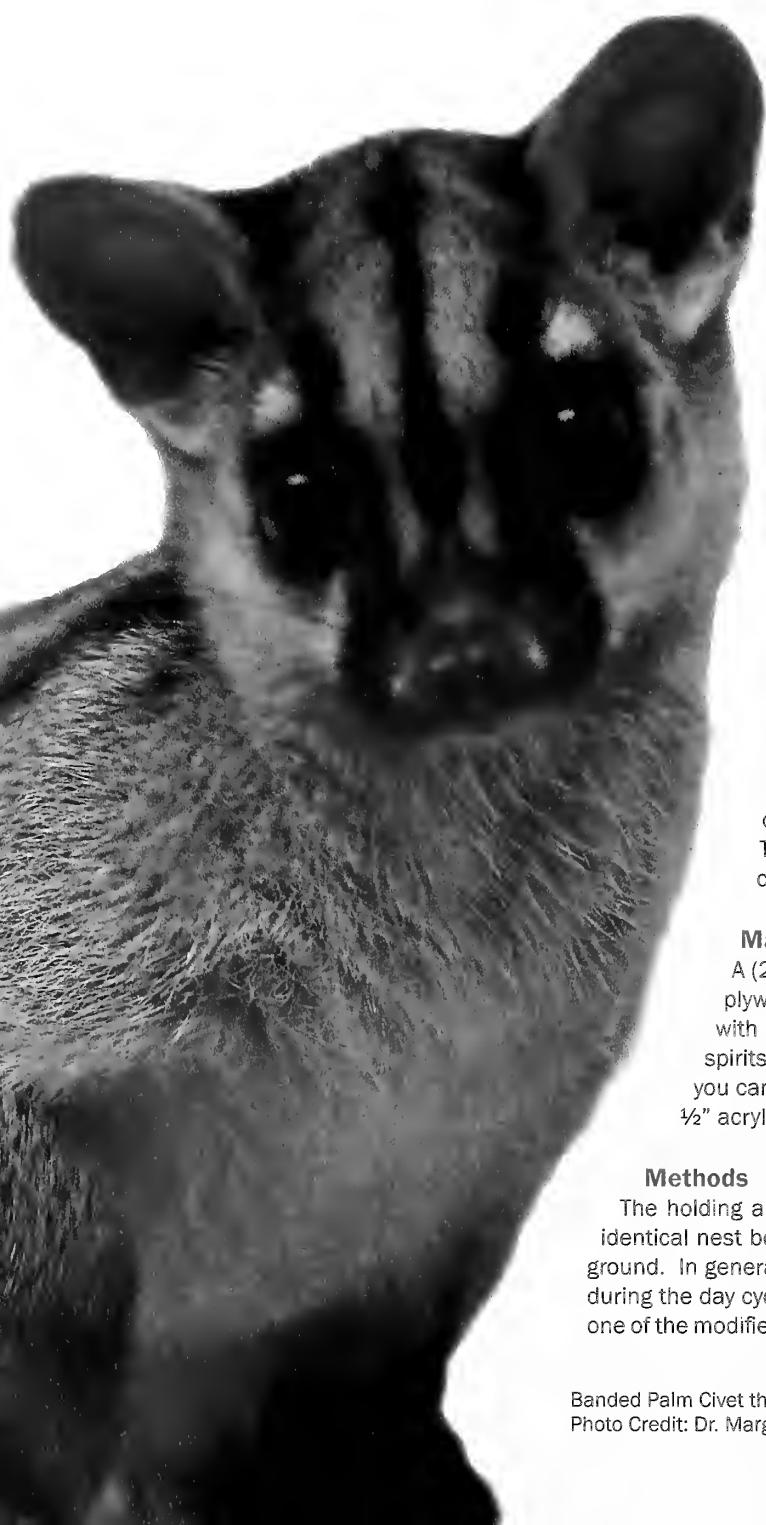
A growing number of facilities are recognizing the link between certified professionals and quality animal care. Several facilities are requiring certification for senior positions.

Visit www.IATCB.org for information and to join our mailing list.



Minimally Invasive Radiographs for Pregnancy Detection in the Banded Palm Civet (*Hemigalus derbyanus*)

Kyle Koehler, Quarantine Keeper II
Nashville Zoo at Grassmere
Nashville, Tennessee



Introduction

Banded Palm Civets (*Hemigalus derbyanus*) are a small and elusive carnivore native to the Sundaic region and a member of the Viverridae family. They are currently listed as Vulnerable according to The IUCN Red List due to a 30% decline in population over three generations (Hon et al., 2008). Little is known about this species in regards to behavior and ecology due to its nocturnal nature.

Manual capture and restraint can be a very stressful experience for animals especially for the amount of time required to perform an ultrasound. Often times ultrasounds are used to detect and monitor pregnancy in animals. In the case of our banded palm civets, a less stressful approach to detecting pregnancy via radiographs was created. Although it is possible to monitor fecal hormone levels, this process can be time consuming.

In order to obtain radiographs without manual or chemical restraint, we developed a method of containment that utilized radiopaque materials. The overall design used was based on their original nest box that had been constructed.

Materials and Specifications

A (26.5") x (12.5") x (14.5") box was constructed using seven-ply cabinet grade plywood and a combination of $\frac{1}{2}$ " and $\frac{1}{4}$ " acrylic. The whole outside of the box, with the exception of the bottom, utilized wood that was treated using mineral spirits-based polyurethane. It is recommended to use at least $\frac{1}{4}$ " acrylic so that you can easily screw into it without cracking the acrylic. For the bottom of the box, $\frac{1}{2}$ " acrylic was used to better support the animal's weight.

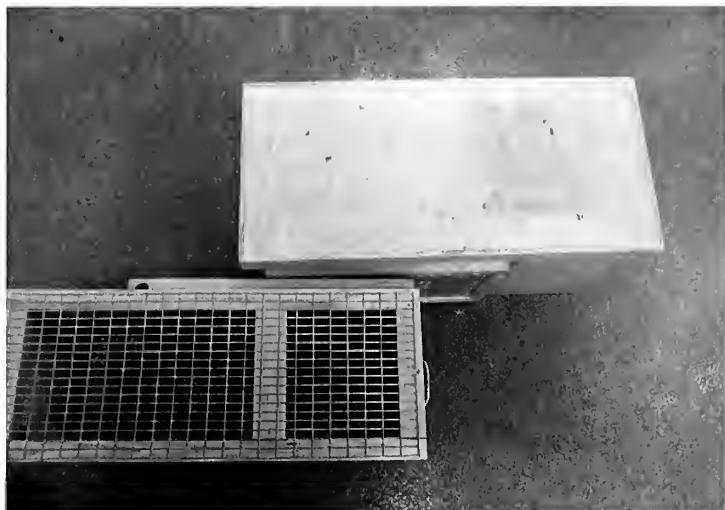
Methods

The holding area for our civets includes two stalls, both of which are outfitted with two identical nest boxes, one of which is elevated and the other rests on cinder blocks on the ground. In general, both the male and female civet prefer to retreat to the elevated nest box during the day cycle. For this reason, it was decided to switch out the elevated nest box with one of the modified nest boxes. Unfortunately, even after one month of attempted acclimation,

Banded Palm Civet that was initially detected using the box described in this article
Photo Credit: Dr. Margarita Woc Coiburn



Photo of x-ray box



Demonstration of how to shift a civet from one box to another

they never transitioned on their own since they preferred the boxes with the wooden floors rather than acrylic.

The modified nest boxes were removed and aligned with the preferred nest box; both entrances were left open. In order to encourage shifting from one box to another, we opened the lid of the box with the civet residing in and allowed for instinct to do the rest. The banded palm civet is a nocturnal animal and as such would naturally prefer to seek refuge in the darker nest box. It should be noted that this transfer occurred in the normal holding area and with capture equipment on hand in the event that something went wrong.

Once in the box, the entrance was closed and it was transported to the veterinary treatment room. The box with acrylic on both the top and bottom allowed for minimal interference with the x-ray beam. One of the benefits of the design is that it allows for dorsal ventral radiographs to be taken in the upright position and the box can be carefully flipped on its side to allow for skyline lateral radiographs. In addition to radiographs, weights can easily be obtained during the same "catch up" by weighing the box before moving the animal into the box and again with the animal in the box.

Discussion

On examination it was found that our female civet was indeed pregnant and the information obtained allowed for us to prepare for an imminent birth and to separate the male and female. This nest box has allowed for us to minimize capture and restraint and to safely obtain radiographs to check for pregnancy and other medical reasons. This method also required no training and relies solely on the natural behavior of seeking a darker shelter. These techniques could be transferred to the management of other viverrids and other small mammals that utilize a nest box.

References

- Hon, J., M.J. Azlan, and J.W. Duckworth. 2008. *Hemigalus derbyanus*. The IUCN Red List of Threatened Species. Version 2015.2. <www.iucnredlist.org>. Downloaded on 07 September 2015. 

Presentation of how to turn the box onto its side and shooting lateral radiographs



Hadiyah and Ember's Story

Reintroduction of a baby orangutan to her mother after only 17 days

By Heidi Eaton, Animal Keeper
Cheyenne Mountain Zoo
Colorado Springs, CO





Hadiyah training to allow the space bottle to "feed" the stuffed animal



Hadiyah allowing the use of sticks to reposition the stuffed animal on her body

Background

Hadiyah is a Bornean Orangutan (*Pongo pygmaeus*) who was born in 1996 at Cheyenne Mountain Zoo. Hadiyah was hand-reared after her mother did not show interest in caring for her. She spent most of her daytime hours in exhibits next to the other orangutans. She was re-introduced to her mother, Sabtu, when she was 11-months-old. They had a strong bond, and Sabtu carried her when she was small. Sabtu still had milk due to self-nursing and an adult male suckling from her, so Hadiyah even nursed for several years. Over the years, Hadiyah was housed in exhibits next to an experienced orangutan mom, where she could have observed some natural maternal behavior.

In April of 2007, Hadiyah gave birth to a male infant, Mahal. Hadiyah was almost 11-years-old at the time of the birth. We had trained the sire, Tujoh, to consistently separate from Hadiyah, but the birth happened quickly and he was still in the exhibit at the time of the birth. He seemed afraid of the infant and moved him away from himself and Hadiyah right away. We were able to retrieve the infant and tried multiple times to give him to Hadiyah, but she would not pick him up. Mahal was raised per Columbus Zoo's gorilla hand-rearing protocol, which we adapted for an orangutan infant. During zoo hours Mahal was howdied

mesh-to-mesh with orangutans, including Hadiyah. He did end up living with Hadiyah for a few weeks, but she was never comfortable carrying him, and they never developed a close bond.

Planning for birth #2

We began working on our training plan as soon as we received a breeding recommendation for Hadiyah. She was trained to retrieve objects and bring them over to us – initially these were balls or Kongs®, but then we started using stuffed animals. We trained her to hold the stuffed animals against her ("hug"). While she was hugging an animal, we trained her to let us "feed" it with a space bottle. The space bottle is a feeding device using tubing, syringe, and a nipple that Denver Zoo developed while supplementing an infant orangutan. Hadiyah was trained to move the stuffed animal from one side of her body to the other and also to let us reposition it with sticks. She already was trained to present her nipples, and we made sure to maintain that behavior, as well as introducing her to a breast pump. We worked with her on being really consistent about locking in off-exhibit spaces and shifting when asked.

We wanted to make sure that we were able to separate Tujoh from Hadiyah well before the birth, so we did training sessions with longer and longer separations. We had to move all of our orangutans around within the building

to facilitate Hadiyah and Tujoh's longer-term separation.

About two weeks prior to her earliest due date, we separated Tujoh and Hadiyah and also started our 24/7 birth watch. We had an around-the-clock team of volunteers and docents who watched Hadiyah from in front of the exhibit during the day and via camera feed overnight. There was a rotating schedule of keepers on-call if the volunteers saw anything unusual.

She's here!

We saw signs of labor from Hadiyah during the day on 29 October 2014, and at 2327, she gave birth. By the time that keepers made the fifteen minute drive to the zoo, she had already cleaned off the infant and was holding it. Everyone was ecstatic! She was already doing so much better than she had with her first birth. Over the next couple of days, though, we became more guarded about how she was doing. Hadiyah stayed in a nest with the baby, barely moving. She had passed the placenta, but it was still attached to the infant. This contributed to Hadiyah not moving much, we think because moving would make the placenta pull on the umbilical cord, and the infant would cry. While she held the infant close, she kept her up near her neck, and we did not see nursing. Hadiyah also had some tissue protruding from her vaginal area, which concerned us. Hadiyah initially would not come



Feeding the infant with the "bottle-on-a-stick" after her reintroduction to Hadiah



Hadiah holding the infant close to her neck in the hours after the birth

over to the mesh, so we could not implement any of the training we had worked so hard on. When Hadiah finally came over to the mesh, she was so protective of the infant, she would not let us get any bottles close to the baby. The infant was beginning to look weak and dehydrated. On November 1, we were ready to anesthetize her to evaluate both Hadiah and the infant. As one of her trainers went to call Hadiah over to attempt hand-injecting her, Hadiah moved to a new position with her arms

resting on a low wall. Then suckling noises were heard! The infant was much more alert and brighter after this, so we believe she did nurse. The immobilization was scrapped and we continued to monitor them.

Over the next day and a half, we continued to see Hadiah sit in the position where nursing had occurred, and milk was dripping from her nipples. The tissue protruding from Hadiah dried up and fell off, and the placenta detached

from the infant. We were all starting to relax a little bit, but we weren't out of the woods yet. On November 3, we didn't observe any potential nursing. When the infant would fuss, Hadiah would again move her up by her face, where nursing was impossible. During training sessions, Hadiah was only allowing the bottle to come close when the infant was sleeping, and of course the infant didn't want to eat when she was sleeping. Hadiah's "safe word" when we were doing this training was raising her hand toward the bottle, and she used it quite a bit. When Hadiah used her "safe word", we listened to her and moved the bottle away from the infant. This helped build trust and ultimately allowed us to get the bottle closer more often, but it wasn't enough. The infant was once again looking weak and less bright.

Intervention

On November 4, when the infant was five-days-old, we immobilized Hadiah. The infant was allowed to nurse from Hadiah while she was asleep. Hadiah was recovered alone in a small off-exhibit space. She watched us bottle-feed the infant and was very interested. While they were apart, we did training with Hadiah, asking her to present her nipple and allow us to hold the infant's face near the nipple. Being able to touch the infant was the only reinforcer she wanted. The infant was given back to Hadiah the same day. There is a small "baby door" to this space, which while small, an orangutan can get their whole arm out of it. We put the infant in a bucket and put it below the door. Hadiah couldn't quite reach her, so a brush was used to push the bucket closer. Hadiah finally was able to reach the infant and pull her into the enclosure with her. Hadiah continued to hold the baby, and we left them in the small space where it was easier to access both of them. There was still no nursing occurring. We talked with Fresno Zoo for more ideas, since they had recently had an infant they needed to intervene with, and we continued to try and supplement-feed the infant. One time, we were able to get 17mls of formula into the infant using IV tubing and a syringe (orally). Keepers were sleeping in the building in order to be able to try feeding the infant anytime she fussed. Hadiah was only participating in training sporadically and continuing to use her safe word frequently.

Time was running out to either have the infant nurse or get formula into her. On November 6, the difficult decision was made to immobilize Hadiah again and pull the infant for hand-rearing. Our ultimate goal was still to have a healthy, mother-reared infant, so we were going to get this baby reintroduced to Hadiah within three weeks. Our immediate tasks were to get the infant eating, urinating, and defecating normally. She would be kept in visual contact with Hadiah as much as possible

Our ultimate goal was still to have a healthy, mother-reared infant, so we were going to get this baby reintroduced to Hadiah within three weeks.

and physical contact through the mesh would be encouraged.

Hand-rearing

Throughout hand-rearing, the infant was in constant contact with a caregiver. We had a team of employees, so she was being held by someone 24/7. During the normal zoo hours, the caregiver was one of our primary keepers, so that the infant and keeper could stay in the service area right next to Hadiah. After a few days, Hadiah showed less interest in the infant. She did not spend as much time at the mesh watching, and was less interested in touching the infant when the opportunity was offered. Intensive training was done with both Hadiah and the infant throughout this period. Hadiah's training priorities were breast pump, getting up and coming over multiple times throughout the night, bringing stuffed animals over to the mesh for a bottle, allowing space bottle and other bottles in near her, and presenting her nipple through the mesh for the infant. The infant's training consisted of having her search for the bottle near the caregiver's armpit/chest, learning to drink from the space bottle and a milk tube, being swaddled and facing away from the caregiver, drinking her bottle through mesh, and nursing through the mesh (which proved difficult). She never really liked drinking from the space bottle, so we tried a low-tech version with a small bottle taped to a stick, which worked much better for us.

We also wanted to try and maintain Hadiah's milk production. We started training with the breast pump with Hadiah, and had some success, but it started to become very aversive for Hadiah, so we discontinued using it. Human consultants

had us somewhat panicked, but after talking with other zoos, orangutans seem to be able to continue milk production, even in the absence of nursing, for much longer than human mothers. We used hot compresses with her, because she sometimes looked engorged and seemed uncomfortable. She really seemed to like these, and we could give her warm towels and she would hold them to her own breasts. Domperidone is a drug that is legal for humans to use for lactation in other countries, and per veterinary prescription, we began giving it to her. She also received lactation tea, Gatorade (shown to help with lactation), and lactation cookies (there really is such a thing!). Other zoos have used Guinness™ ale, but Hadiah was not a fan. Another aspect of the training, which should not be overlooked, is the observational learning we believe took place. Even though Hadiah didn't spend a ton of time at the mesh, she did come over and watch every feeding that took place during howdy times. She was able to observe this pattern: Infant cries, keeper comes with bottle, infant quiets. Keepers practiced

feedings as though the infant were on Hadiah, so the keeper that was holding the baby would actually go into an empty orangutan space while another keeper used the bottle-on-a-stick method through the mesh.

Reintroduction

We had several criteria to meet before reintroduction. Hadiah had to be willing to get up and come over to the mesh multiple times every night for training/interaction with keepers. We had a schedule of keepers coming in to do this. Hadiah needed to hold a stuffed animal and allow it to be "fed" with the bottle-on-a-stick for a long enough time period (this was trained prior to the birth, but we maintained the behavior for the three weeks we had the infant away from Hadiah). The infant needed to take all of her daytime bottles through mesh from the bottle on a stick, and for nighttime feedings she needed to root around on the caregiver to find the nipple. The infant also needed to have bowel movements with good frequency and consistency and have consistent weight gain. These criteria

Infant getting accustomed to drinking her bottle through mesh





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were met and a reintroduction was done 2 1/2 weeks after hand-rearing had begun.

For the first attempt, the infant was swaddled while sleeping and put in a tub in the small off-exhibit space. Hadiah was given access to the infant. She looked at the infant, but was more focused on the keepers. When the infant woke up and cried, Hadiah closed the door between herself and the infant. Although discouraged, the keepers got the infant back to sleep, re-swaddled, and back in the tub in the holding space. The door was reopened and the keepers left the service area. This time, Hadiah picked up the tub and took it into the exhibit, where the infant remained sleeping. After about an hour, the infant started crying, but Hadiah still wasn't picking her up. Keepers shifted Hadiah into another exhibit, fed the infant, and got her back to sleep. Twenty minutes after being given access to the baby, Hadiah carried the tub into the other exhibit and lay down next to the tub. When the baby's next feeding time came, keepers asked Hadiah to bring the tub over to the training door. She started to do so, but wasn't careful and the baby fell out of the tub. Now she had a screaming baby, not in a tub! She ran to the other exhibit, but would not let keepers close the door between her and the baby. The keeper pleaded with Hadiah that one of them needed to pick up the baby – "Can you pick it up?!" Hadiah finally picked up the baby, at first upside down and away from her body. But after a few seconds, she hugged the baby. Shortly after that, she came over to the training door with the infant and let keepers feed her with the bottle-on-a-stick.

The rest of the story

Bottle-on-a-stick feedings continued with nine feedings over the course of each 24 hours. This required two people for each feeding, one to feed/train Hadiah and one to feed the infant. We got really creative with staffing, using employees from other departments as the "baby feeder" and someone Hadiah was familiar with as her trainer. Hadiah learned very quickly to come wait by the door anytime the infant cried and was hungry. We worked on shaping nursing position with Hadiah and the infant. On December 8, we started delaying some of the feedings to see if they would try new things, when the infant was fussing and hungry. We also used an iPad to show Hadiah videos of orangutan mothers nursing (Thank you to zoos who sent videos!). Finally, on December 19, we had confirmed nursing at both 6am and 9am on Hadiah's left side. On January 7, she started nursing on the right side as well. We continued with the supplemental feedings, gradually tapering them based on need. If we saw a feeding where the infant was consistently drinking only a small amount from the bottle, we would cut that one out. At first, Hadiah seemed to have less milk in the afternoons. Eventually, Hadiah was doing all the feeding and she still is! The infant was named Ember, which means "bucket" in Bahasa Indonesian, because of the way she was reintroduced.

Thanks to our wonderful docents, volunteers, and staff who spent many hours (often in the middle of the night) helping this all to work out. Thanks to Dina Bredahl, Mandy Hester, and Rick Hester for their help in putting this paper together.



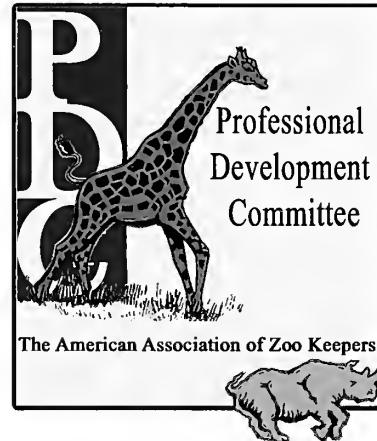
AAZK Professional Development Committee

Second Call for Topical Workshops

2017 AAZK National Conference

The 44th Annual AAZK National Conference
Washington D.C., August 27-31, 2017

Conference Theme:
“Keepers United in Saving Species”



Second Call for Topical Workshops

The AAZK Professional Development Committee is pleased to announce the second call for Topical Workshops for the 2017 AAZK National Conference hosted by the National Capital AAZK Chapter. The Host Chapter has chosen the theme “Keepers United in Saving Species”, which will highlight how zoo and aquarium professionals work to advance animal care and conservation.

Deadline for Submission of Abstracts for Workshops: January 15, 2017.
Authors will be notified regarding acceptance no later than February 15, 2017.

Workshops – Format

Workshop subjects should be in-depth explorations of animal health, animal management, taxa-specific husbandry, and keeper professional development. Workshops should be two hours in length. Subjects that require more than two hours should be submitted as “Part One” and “Part Two”.

Open Topical Workshops – New this year

This new Open Workshop format will offer unlimited attendance (based on the capacity of the ballroom) and will be best suited for panel discussions or lecture-based workshops with a Q & A session at the end.

Limited Topical Workshops — Held in limited capacity breakout rooms, this format is best suited for small group interactive workshops and will have a cap on the number of participants.

Guidelines for Abstracts:

- ▶ Abstracts should be no more than 250 words and should focus on the main theme of the Workshop
- ▶ Abstracts should be submitted as a Microsoft Word® document via e-mail to: pdc@aazk.org.
- ▶ File should be named WorkshopAbstractAuthorlastname2017
- ▶ Please include the following information along with the abstract:
 - Workshop Title
 - Name of the authors and presenters
 - Please indicate ONE contact person that will communicate with PDC
 - Institution/Affiliation
 - Position/Title
 - Workshop Format: Indicate Open Workshop or Topical Workshop
 - Workshop acceptance may be conditional on room availability. If either format would work, please indicate that both would be acceptable.

Seeing Stripes: Tracking Zebras at the Great Grevy's Rally

Tim Thier, Zoological Manager/Antelope Area

Kim Downey, Keeper/Antelope Area

Katie Pilgram-Kloppen, Keeper/River's Edge

Saint Louis Zoo, Saint Louis, Missouri

The Grevy's zebra (*Equus grevyi*) is one of Africa's most endangered mammals; in the past four decades the population has decreased by 80% from approximately 15,000 animals to less than 2,800 animals. The Saint Louis Zoo's WildCare Institute's Center for Conservation in the Horn of Africa has been working to save this endangered species for the last twelve years by supporting community-based partnerships and actively establishing a variety of conservation, research and education programs.

The Great Grevy's Rally was a national census of Grevy's zebra held in late January 2016 throughout northern Kenya and has been the most comprehensive survey of the Grevy's zebra population to date. The Saint Louis Zoo helped fund this unique project which brought together members of the public, the Kenyan Wildlife Service, local community conservancies and many more in an effort to gain valuable data on the population of this endangered species. The authors had the opportunity to travel to Kenya to take part in this ground breaking event.

The Rally

After traveling thirty-three hours from St. Louis to Kenya, we spent two days prior to the Rally meeting with conservancy managers, rangers and citizen scientists to distribute information on their designated areas and to train them on how to use GPS cameras to take proper pictures of the zebras. Each zebra has a unique stripe pattern and researchers use the pattern on the right hip to identify each individual. Over the two day Rally, participants simultaneously conducted a census throughout the entire range of Grevy's zebra in Kenya and used the GPS cameras to photograph the right side of each zebra encountered. Overall the 118 teams that took part in the Rally captured over 50,000 photographs! The photographs were downloaded into a national zebra ID database and a specialized computer program is being used to process the photographs

and identify each individual in order to produce a population estimate in each area. With these data, researchers can then determine whether or not the Grevy's zebra population is stable, growing or decreasing.

The Animals

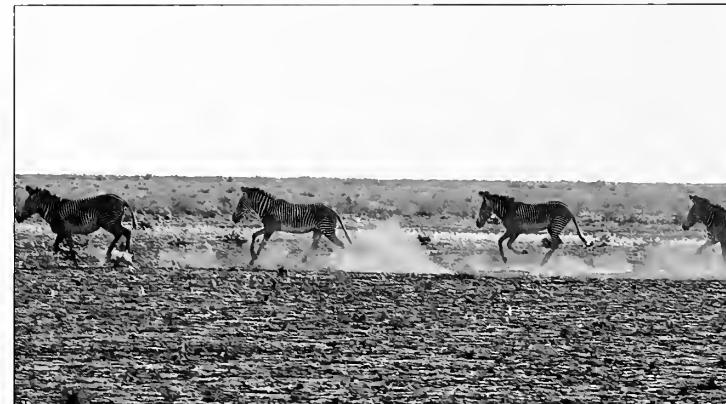
As zoo keepers, the chance to visit Kenya and see many of our Zoo's species in their natural habitats was an experience we will never forget. Our designated survey area was in Laisamis, which is in northern Kenya and is very hot and dry. Therefore, there are fewer zebras living in this area and they often must travel longer distances to find sources of water. This region is considered to be at the northernmost edge of the zebra habitat and is a high priority region for conservation. However, we were lucky enough to spot our first zebra about fifteen minutes into the first day of the Rally! Initially we thought they looked small in the wide open grasslands, but as we approached we were suitably impressed by their size (the Grevy's zebra is the largest of the three species of zebra). During the two days of the Rally, we spent about ten hours in a Land Cruiser driving around the grasslands looking for zebras and found about thirty. It was very encouraging to see a mix of young and old zebras as well as males and females. One of our favorites was a very pregnant female who looked as if she could give birth at any moment!

While tracking the zebras, we saw a variety of other species including gerenuk, Grant's gazelles, kori bustards, and ostrich. We also spent a bit of time visiting Kalama Community Conservancy (a local conservancy supported in part by the Saint Louis Zoo), Samburu National Reserve, and Lewa Wildlife Conservancy. During those visits we were fortunate to see many of the diverse wildlife that inhabit these areas, from elephants and giraffe to hippos and leopards!

Photographing the zebras out in the field



This image was photographed by Kim Downey while surveying zebras on Day 2 of the Rally in the Laisamis region



The People

In addition to the conservation work being conducted and seeing the animals in the wild firsthand, many people shaped our experiences along the way and made this trip unforgettable. We worked closely with Grevy's Zebra Trust, an independent non-profit organization working to save this endangered species in Kenya and Ethiopia. Their hospitality included driving us many miles throughout northern Kenya, cooking campfire meals, teaching us a few words in Swahili, educating us on their current field conservation projects, and sharing their personal stories of adventure.

The Grevy's Zebra Trust employs warriors from the local communities to help monitor Grevy's zebra populations and keep their communities informed about the status of the zebra. These young men often spend time away from their villages living in the field with zebras and other wildlife, making them very knowledgeable about where these animals spend their time. During the Rally, we were assisted by a warrior named Petro. We had the opportunity to camp in his village, meet his wife and family, and talk with the chief about how the village runs and how they view the zebras. We also befriended several children who were amused with the "houses" (tents) we had brought to sleep in. They were there to greet us when we returned from the field and were excited to look at our photos of zebras, play silly games, and help us pass the time during the extreme heat of the day. We felt very welcomed by the people of Kenya and enjoyed meeting so many people that accepted us as one of their own.

At the end of the trip we visited Nairobi with the Grevy's Zebra Trust warriors. Most of these men had never been to Kenya's capital city before, so this experience was truly once in a lifetime. They interacted with giraffe and orphaned elephant calves up close and saw a black rhino for the first time during trips to local tourist hotspots. The purpose of the trip was to honor their dedication and work with the Grevy's zebra. This work was highlighted at the Nairobi National Museum, where their stunning portraits hung on the walls of the new exhibit *Zebra People: Guardians of the Grevy's* by photographer Mia Collis in collaboration with the Grevy's Zebra Trust.

What's Next

We are so thankful to have had the opportunity to participate in the first Great Grevy's Rally, a citizen science approach to census this endangered animal. With the final results still pending, the Rally organizers have been more than enthusiastic about the high turnout for the event as well as the local and international support they received. If you're looking for a way to become involved with field conservation, organizers are planning for the next Rally to occur in August 2017.

This image was photographed by Kim Downey while surveying zebras on Day 2 of the Rally in the Laisamis region



Grevy's Zebra Trust and Mia Collis are also interested in starting a traveling tour of the *Zebra People* exhibit throughout the United States. After seeing the warriors' portraits and reading their stories about the Grevy's zebra, we hope you will feel as inspired as we did meeting these true conservationists.

To learn more about the Grevy's zebra, the Great Grevy's Rally and the *Zebra People* exhibition, visit www.greatgrevysrally.com, www.grevyszebratrust.org and <http://www.miacollis.com/zebra-people/>.



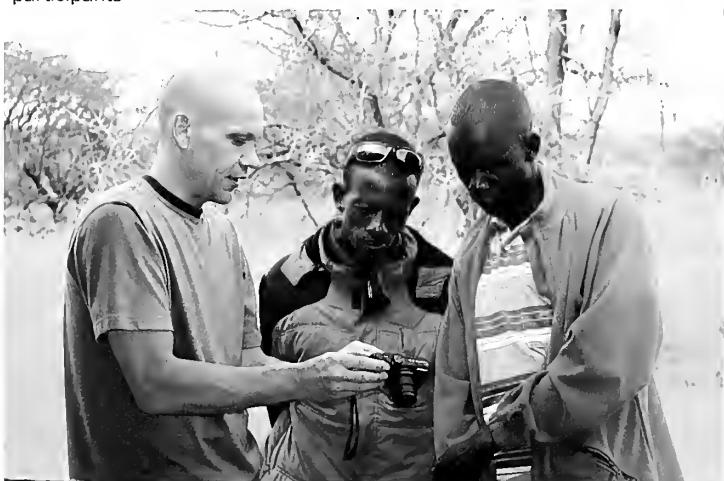
This is a group shot of the Saint Louis Zoo team with Grevy's Zebra Trust team at the opening of the "Zebra People" exhibit



Photograph of Tim Thier, Kim Downey and Katie Pilgram-Kloppe near the Grevy's Zebra Trust camp in the West Gate Community Conservancy



Tim Thier demonstrates how to use the GPS enabled digital camera to rally participants



Professional Development and India: Species, Deities and Communities

Jeremy Fontaine
Reptile Keeper, San Diego Zoo



I was extremely fortunate and grateful to receive this year's National Professional Development Grant that helped me travel to India to study the country's animal species, deities and communities. I would like to thank everyone involved in the decision making of this process, those who wrote my recommendations and my co-workers for supporting me during my trip to India.

The 2016 AAZK Professional Development grant allowed me to travel to India on a world wind journey through the rich ecological, cultural and spiritual landscapes of the Western Ghats. This was my first time in India and other than books, movies and word of mouth; I did not really know what I was going to experience. The Western Ghats is a biodiverse hotspot, home to many endemic species of plants and animals. Conservationists cannot fathom the importance of the Western Ghats to India, and unfortunately only 9% of the rainforest is protected. Fortunately, due to the country's devotion to Hinduism, sacred groves are becoming more and more vital to the future of the Western Ghats, pushing communities to become environmental stewards of these sacred lands.

In this course, I learned the multifaceted relationship between people, nature and spirituality. As a reptile keeper at San Diego Zoo Global, I know firsthand what it takes to bring an animal back from the brink of extinction. I work with many reptiles and amphibians from all over the world that are in need of our help. Habitat loss, poaching, illegal logging, illegal pet trade and traditional medicine are all factors affecting reptiles and

amphibians in India. In zoological captivity, I find myself reading many books and peer reviews on the correct methods in caring for an animal, especially in replicating what life is in the wild. I tend to forget that life in the wild is not easy, and it takes more than a few plants and heating lights to ensure the future of a species.

Before attending this course, I really wanted to observe how reptiles and amphibians were treated in India. Many frogs in India are collected in the wild to be used in biology classes for dissection throughout the country. Unfortunately, there are no local Indian companies who raise frogs for dissection, thus quickly disseminating wild frog populations.

Turtles and tortoises are affected by local practices because they are used for traditional medicine, the pet trade and are victims of habitat destruction. Again, there is little to no regulation on the sale of these turtles and tortoises. In Hinduism, I learned a tortoise carries the world on its back so many houses and temples I visited had depictions of turtles and tortoises as avatars to their god, Vishnu. This is quite the contradiction between beliefs and human practice!

During my trip to India, our group partnered with the Applied Environmental Research Foundation (AERF). AERF has worked with communities in the Western Ghats for over two decades to support work on sacred groves and community conservation. I visited nine sacred groves. Each sacred grove held a different importance to the surrounding communities, spiritually and ecologically. I had to come up with an inquiry question when visiting each sacred grove because each grove was unique. My inquiry question was, ‘Does the deity matter or a factor on what animal species are represented in a temple? Will there be more diversity of animal species in Shiva temples compared to other temples?’

One day I had a very unique conversation with an AERF partner, Sameer, regarding Hinduism’s many gods. To me, I felt like since so many of their gods are depicted as animals, especially tigers, elephants and turtles, how could locals go about killing them especially when cows are never killed? During my talk with Sameer I was told that Hinduism is not a religion, but a philosophy and it does not matter how one worships. He explained that there is a deity for every problem in life, no matter the obstacle. What makes Hinduism so special is it has so many different qualities and is constantly evolving and adapting to everyday life

I really want to share a humbling experience during my trip to India. During my visit to one of the temples in Bhimashankar, I started noticing



(Above) Trash on beach, Indian Ocean (Below) Group photo





(Above) Statues of turtle and cow being worshipped (Right) Hiking the Western Ghats

how often the swastika is used and apparent in Hinduism. In our culture, the swastika is such a negative symbol. In many temples and households, there would be two small infant feet with a swastika next to it. Unfortunately there was little to no internet connection, and I did not have access to a library, so I had to ask many of the locals and class leaders about the swastika. It was a complete shock to me because I started learning that in Hinduism, the swastika represented the human mind as incapable of understanding God. The swastika turns and rotates and has no beginning and no end and life has so many questions, problems and knowledge that have to be investigated. Hinduism is full of positive messages and it does not matter how you worship, where you worship, who you are because everyone is equal. The Nazis adopted the swastika as it was believed that true Aryans lived in the northern part of India and used this symbol. A very interesting connection....

Throughout this trip I did face many challenges, especially as someone who loves mother earth. There was so much trash and detritus... EVERYWHERE! One of our locations was near the Indian Ocean, so as a group we traveled down to the ocean to learn about sea turtles and fishing conservation. The second I stepped foot onto the sand, or should I say, trash, I knew these animals were in grave danger. There was barely an area to put a towel down. I was very frustrated and asked one of our AERF partners why there was so much trash and he replied, "Where do we put it and who will pick it up because the government does not do anything." I understood his answer in this country which is overpopulated with too many people living in small areas. However, I

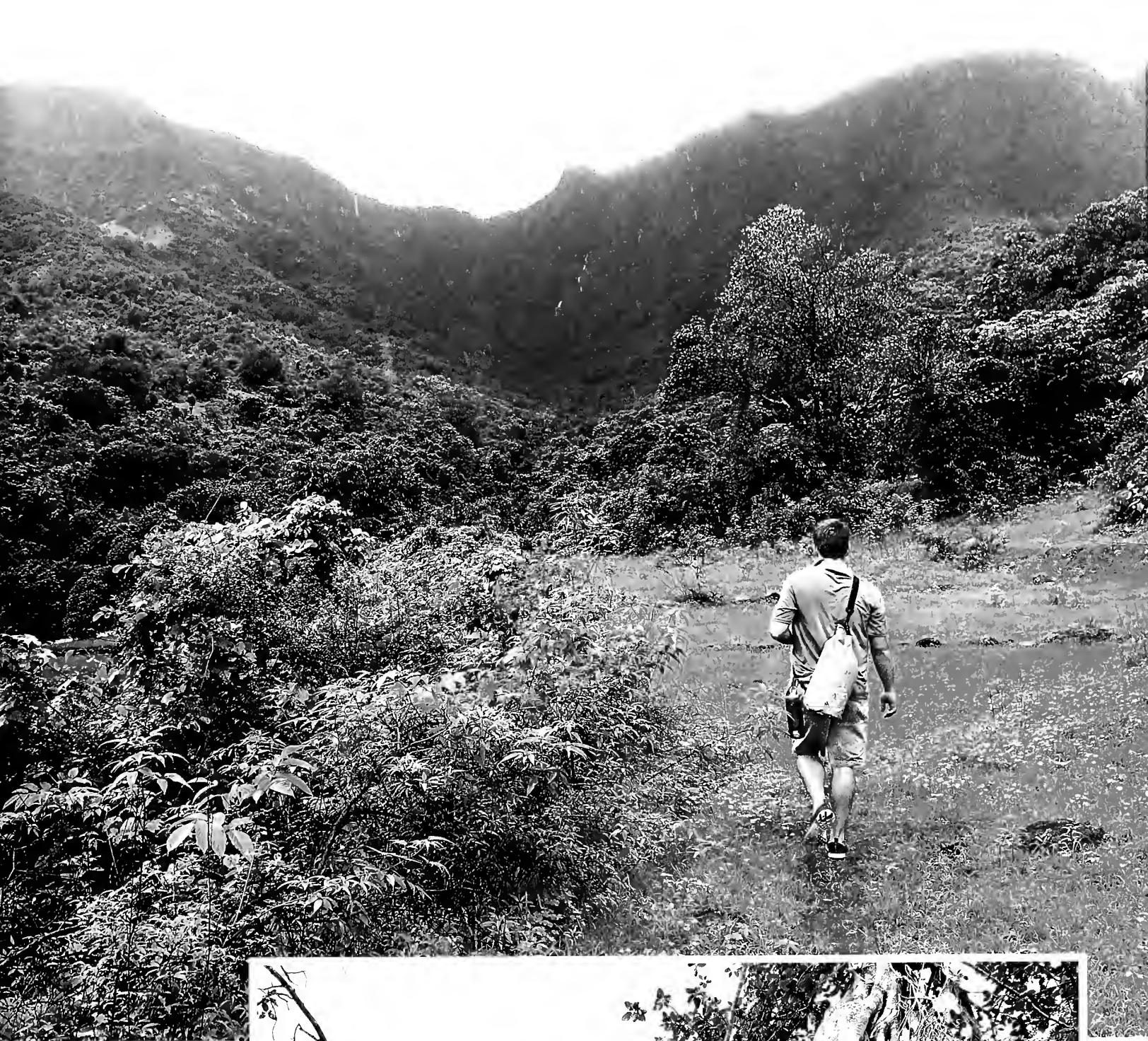
think that we are all stewards of the earth and need to make it our personal responsibility to respect it.

I was constantly surprised. At the zoo we focus on the destruction of palm trees in order to gather its oil and promote buying items that are palm oil free. In India I saw a lot of ficus trees that are left to grow and are not destroyed. A ficus tree can grow very large and is home to many species of insects and birds, especially the Hornbill. Hornbills are known as seed dispensers and this is very important to the Western Ghats. These birds help disperse plant seeds around the Western Ghats and without them, many animals that depend on seeds for food would as well. Ficus trees are used by many locals during the hot and wet seasons as shelter and shade and are often used as meeting points for communities. Ficus trees are also used in religious ceremonies and are often associated with temples in the area. Finally, the fruit produced by ficus trees, the fig, is a food source to many animals like fruit bats, langurs, mangabeys, hornbills and other frugivores.

Words cannot describe the impact India had on my personal and professional life. I had the opportunity to observe many frogs, snakes and turtles in the wild and learned how the locals perceive them. Traveling to India was definitely worth my time and it helped me expand my knowledge as a zoo keeper, environmentalist and conservationist and to better understand what animals are facing day to day in the wild. This course also allowed me to witness human destruction of an ecosystem and the need to save even the smallest living thing that could be an important part of any ecosystem. To bring an



animal back from near extinction, it takes more than captive breeding but a community of locals that wants to help these animals survive in their native habitat. I made great connections with members of the AERF team with whom I am still in contact today. I learned how to identify many local plants and birds and learned how religion plays such an important part in saving species of the Western Ghats. More importantly I realized that conservation is not a one way street - there are many roads and avenues that can lead us, as environmentalists, to our goals of saving endangered species for future generations. 



(Right) Ficus Tree



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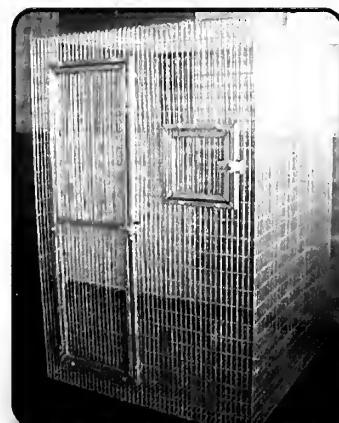
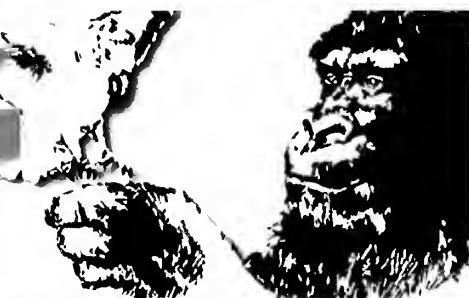


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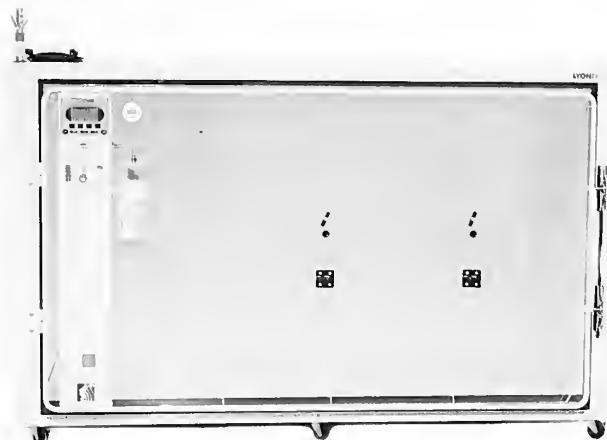
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